

NEUTRALIZED TRANSPORT EXPERIMENT*

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Final focusing has been a subject of intense study from the very early days of heavy ion fusion (HIF). Neutralized ballistic transport (NBT)[1] is presently being studied for propagating intense heavy ion beams inside a reactor chamber to an inertial confinement fusion (ICF) target. A recent HIF driver study[2] demonstrates that stringent final-focus requirements[3] can be met provided that active neutralization is implemented to overcome the formidable space charge of the intense ion beams. To quantitatively ascertain the various mechanisms for neutralization, the Neutralized Transport Experiment (NTX) was constructed at Lawrence Berkeley National Laboratory. In this experiment a high quality beam is passed through well-characterized plasma sources to neutralize space charge of the beam. Here we describe NTX beam line system, techniques to control stray electrons in vacuum transport, measurements of current transmission, phase space, beam spot size, beam halos, and preliminary results of beam neutralization along with detailed comparisons with theory.

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